

## CLAIMS

We claim:

1. A method comprising:

maintaining, in a first network entity, a first record of multicast addresses, the first record comprising at least one multicast address;

maintaining, in a second network entity, a second record of cell sectors that are currently serving one or more mobile stations that are associated with at least one multicast address in the first record; and

transmitting at least one multicast message to the cell sectors that are included in the second record;

whereby the at least one multicast message is transmitted from each cell sector included in the second record to mobile stations within those cell sectors.

2. The method of claim 1, further comprising:

providing each of the one or more mobile stations with a key that enables a mobile station to receive and to further process multicast messages; and

receiving and further processing, at the mobile stations that have been provided with a key, the at least one multicast message.

3. The method of claim 1, wherein the at least one multicast message is an IP message.

4. The method of claim 1, wherein at least one of the mobile stations in the multicast group is a 3G mobile station.

5. The method of claim 1, wherein the step of maintaining the second record comprises periodically querying cell sectors to determine the current location of mobile stations associated with multicast addresses that are included in the first record.

6. The method of claim 1, further comprising:  
sending, from a mobile station to a network entity, an indication that represents a user's request to join a multicast group, the indication being sent to a network entity; and  
using the indication to update the first record and the second record.

7. The method of claim 1, wherein the first network entity is the second network entity.

8. In a network of the type comprising a packet-switched network and a radio network having multiple cell sectors serving mobile stations, a method comprising:

maintaining, in a network entity, a first record of multicast addresses, the first record comprising at least one multicast address;

5 maintaining, in the network entity, a second record of cell sectors that are currently serving one or more mobile stations that are associated with at least one multicast address in the first record;

updating the second record as the one or more mobile stations move into and out of cell sectors; and

10 transmitting at least one IP multicast message to only the cell sectors that are included in the second record.

9. The method of claim 8, wherein updating the second record comprises periodically querying cell sectors to determine the current location of mobile stations that are associated with the multicast addresses that are included in the first record.

10. The method of claim 8, further comprising:  
sending, from a mobile station to a network entity, an indication that represents a user's request to join a multicast group; and  
using the indication to update the second record.

11. The method of claim 8, further comprising:  
transmitting, from a network entity to each mobile station associated with a multicast address in the first record, a key that enables a mobile station to receive and further process multicast messages;

5 whereby the at least one IP multicast message is transmitted from each cell sector included in the second record to mobile stations within those cell sectors, and whereby mobile stations that have received the key receive and further process the at least one IP multicast message.

12. A communications device for use in a communications network of the type comprising a radio network that includes at least one cell sector that serves mobile stations, the device comprising:

a processor;

5 a memory;

at least one multicast address stored in the memory;

at least one cell sector identifier stored in the memory, the at least one cell sector identifier corresponding to a multicast address stored in the memory; and

10 a set of logic stored in the memory and executable by the processor to cause the device to forward multicast packets having a multicast address that is the same as a stored multicast address to each cell sector that is identified by a cell sector identifier that corresponds to the stored multicast address.

13. The communications device of claim 12, further comprising:

a network interface; and

5 a set of logic stored in the memory and executable by the processor to cause the device to communicate with other entities via the network interface and to responsively update the at least one multicast address stored in the memory and to update any cell sector identifiers stored in the memory that correspond to the at least one multicast address.

14. A radio network multicast server, comprising:

a processor;

a memory;

at least one multicast address stored in the memory;

5 at least one cell sector identifier stored in the memory, the at least one cell sector identifier corresponding to a multicast address stored in the memory;

a set of logic stored in the memory and executable by the processor to cause the radio network multicast server to forward multicast packets having a multicast address that is the same as a stored multicast address to each cell sector that is identified by a cell sector

10 identifier that corresponds to the stored multicast address;

a network interface; and

a set of logic stored in the memory and executable by the processor to cause the radio network multicast server to communicate with other entities via the network interface and to responsively update the at least one multicast address stored in the memory and to  
15 responsively update any cell sector identifiers stored in the memory that correspond to the at least one multicast address;

wherein the radio network multicast server transmits messages to cell sectors according to the cell sector identifiers stored in the memory.

15. A wireless multicast system of the type comprising a radio access network and a packet-switched network, the system comprising:

a radio network multicast server, the radio network multicast server including a first record of multicast addresses, the first record comprising at least one multicast address;

5 the radio network multicast server further including a second record of cell sectors that are currently serving one or more mobile stations that are associated with at least one multicast address in the first record, the second record linking cell sectors to specific multicast addresses in the first record; and

10 at least one mobile station that is served by a cell sector that is included in a second record in the radio network multicast server;

wherein at least one multicast message is transmitted to the at least one mobile station in accordance with the first record and the second record.

16. The system of claim 15, further comprising a multicast application server communicatively coupled to the radio network multicast server;

wherein the at least one multicast message is transmitted from the multicast application server.

17. The system of claim 15, wherein the at least one mobile station sends an indicator to a network entity, the indicator causing the radio network multicast server to add the at least one mobile station's cell sector to the second record.

18. The system of claim 15, further comprising a multicast session manager communicatively coupled with the at least one mobile station, the multicast session manager transmitting to the at least one mobile station a key that enables the at least one mobile station to receive and further process multicast messages.

19. The system of claim 18, further comprising a AAA server communicatively coupled with the multicast session manager, the AAA server providing a multicast authorization status indicator associated with the at least one mobile station to the multicast session manager;

wherein the key is only transmitted to those mobile stations authorized by the AAA server to receive multicast messages.